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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,698	10/05/2006	Hiroyuki Kikuchi	P30902	2938

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EXAMINER	
ISLA RODAS, RICHARD	

ART UNIT	PAPER NUMBER
2829	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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TH

Office Action Summary	Application No.	Applicant(s)	
	10/599,698	KIKUCHI ET AL.	
	Examiner	Art Unit	
	Richard Isla-Rodas	2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12-16* is/are allowed.

6)☒ Claim(s) *1-5 and 17* is/are rejected.

7)☒ Claim(s) *6-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 October 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/07, 01/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1-3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US Patent to Hiruta #5,952,841 in view of the US Patent to Sakai #5,650,730.

In terms of claims 1 and 17, Hiruta shows in Figure 6, a test system, comprising a pre-test electronic device supplying means (tape 2b) for providing electronic devices before testing, a loader use inverting means (3b) for inverting an electronic device supplied (as explained in lines 33-35, column 3), a contact arm (4) for picking up and moving an inverted state image sensor inverted by said loader use inverting means (arm 4 receives the chip from the inverting means, holds it and places it on test head 5+6 so that it can be tested as explained in lines 36-40 of column 3) and bringing input/output terminals of the inverted state electronic device into electrical contact with a contact of said test head (as explained in lines 55-56 of column 3, the electronic device is placed on the test head 5+6 so that the electronic device's conductive bumps correspond with contacts on the test head 5+6), an unloader use inverting means (3a) for inverting an image sensor finished being tested (as explained in lines 41-44 of column 3), and a after-test electronic device storing means (tape 2b) to store the electronic devices inverted by said unloader use inverting means.

Hiruta substantially teaches all of the claimed elements as discussed above, except for using stackers for storing pre-test and after-test electronic devices. Instead, Hiruta uses a tape (2b) that supplies the pre-test electronic devices and also stores the electronic devices after they're tested. The use of stackers is however, well known in the art as exemplified by Sakai. Sakai shows in figure 1, a semiconductor device system including a storage stackers (16) that store pre-test devices which are transferred to test locations and then stored on storage stackers (26) that store the after-test devices as explained in lines 54-65 of column 5. It would have been obvious to one of the ordinary skill in the art, at the time of the invention, to use the teachings of pre-test and after-test stackers as disclosed by Sakai, to replace the tape in Hiruta's system for the pre-test and after-test stackers of Sakai's device, in order to store the electronic devices in arrays (one on top of the other), since accessing and retrieving semiconductors stored in arrays is simpler than accessing the same semiconductors bonded to a reel tape (which must be rolled out).

Also, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham, 2 USPQ F.2d 1647 (1987).* That is, although Hiruta's device does not explicitly uses his system to test image-sensors, it anticipates the claimed device since it comprises all of the structural limitations recited in the claim in order to do so.

As to claim 2, Hiruta shows in Figure 6, each of said loader use inverting means and said unloaded use inverting means can simultaneously invert **one** electronic device.

Hiruta in view of Sakai substantially discloses the claimed invention except for explicitly stating that the inverting means and holder "can" simultaneously invert **two** image sensors. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide two of Hiruta's inverting means and holders in order to load and retrieve two electronic devices at the same time and thus reduce time spent by half, since it has been held that mere duplication of essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.

Furthermore, the functional recitation that the inverting means and holder "**can** simultaneously invert two or more image sensors" does not further limit the claimed device because is narrative in form. In order to be given patentable weight, a functional recitation must be expressed as a "means" for performing the specified function, as set forth 35 U.S.C. 112, 6th paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language. In re Fuller, 1929 C.D. 172; 388 O.G. 279. .

As to claims 3, Hiruta teaches that each of said loader use inverting means (3b) and said unloader use inverting means (3a) includes a mechanism (holder) that picks and inverts (while holding the chip, as explained in line 33 of column 3) and a rotation mechanism (pivot on which arm 3a rotate) for making said first holder rotate. Likewise, use inverting means (3b) includes a mechanism (holder) that picks and inverts (while holding the chip, as explained in line 33 of column 3) and a rotation mechanism (pivot on which the arm in 3b rotates) for making said first holder rotate.

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiruta in view of Sakai further in view of Ikeda et al. #5791484 (Ikeda hereinafter).

In terms of claim 4, Hiruta in view of Sakai substantially teaches all of the claimed elements as discussed above including the holder using, what appears to be suction means, for holding the semiconductor device. However, Hiruta does not explicitly state that the holder uses an air suction nozzle. The use suction nozzles is however, well known in the art. For example, Ikeda shows in Figure 10, a mechanism comprising an air suction nozzle (26) that pick up, holds and delivers an electronic device (3) from one place to the next (see lines 56-58 column 8). It would have been obvious to one of the ordinary skill in the art, at the time of the invention, to use the teachings of air suction nozzles as disclosed by Ikeda to include an air suction nozzle in the holder disclosed by Hiruta to handle the electronic devices from the upper or lower sides instead of the lateral sides where the contacts are arranged in order to prevent a shorting between the contacts.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiruta in view of Sakai and Ikeda and further in view of the US Patent to Zaiser #6,624,646.

As to claim 5, although Hiruta does not explicitly state that the holder can be exchanged. However, exchanging parts within a system in order to accommodate a plurality of differently sized devices or simply to replace parts of the system that have malfunctioned during normal use is well known in the art. For example, Zaiser teaches

a testing apparatus including parts that can be easily exchanged without requiring exchange the entire system (see lines 14-16 column 3). Given the teachings of Zaiser, a person having ordinary skill in the art at the time of the invention would have readily recognized the desirability and advantages of modifying Hiruta's device by employing the well known or conventional features of exchangeable parts, such as disclosed by Zaiser, in order to easily replace a defective part of the system without requiring to exchange the entire system.

Allowable Subject Matter

5. Claims 12-16 are allowed. The following is an examiner's statement of reasons for allowance:

In terms of claim 12, the prior art of record does not teach alone or in combination a test method for an image sensor which brings input/output terminals of an image sensor into contact with a contact of a test head, emits light to a light receiving surface of said image sensor from a light source, a first inversion step of inverting the image sensor before testing, a test step of bringing the inverted state image sensor into electrical contact with a contact of said test head and emitting light on a light receiving surface of that image sensor from a light source to test the optical properties of that image sensor, and a second inversion step of inverting the tested inverted state image sensor, in combination with all other elements in claim 12.

As to claims 13-16, the claims are allowed as they further limit allowed claim 12.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Claims 6-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In terms of claim 6, the prior art of record does not teach alone or in combination a system wherein the rotation mechanism has a pinion gear supporting said first holder and a rack gear intermeshing with said pinion gear and converts linear force supplied to said rack gear to rotational force so as to make said first holder rotate, in combination with all other elements in claim 6.

As to claim 7, the prior art of record does not teach alone or in combination a system wherein each of said loader use inverting means and said unloader use inverting means further has a second holder formed with a recess able to hold said image sensor, in combination with all other elements in claim 7.

As to claim 8, the claim is objected as it further limits objected claim 7.

In terms of claim 9, the prior art of record does not teach alone or in combination a system including an imaging means able to obtain an image of a back surface of said image sensor after being inverted by said loader use inverting means and before being supplied to said test head, in combination with all other elements in claim 9.

As to claims 10-11, the claims are objected as they further limit objected claim 9.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Document Number Number-Kind Code e.g. 0500004 A1	Date MM-YYYY	Name	Classification
4,510,673 A	04-1985	Shils et al.	438/15
5,644,245 A	07-1997	Saitoh et al.	324/754
5,788,084 A	08-1998	Onishi et al.	209/573
6,184,675 B1	02-2001	Bannai, Kuniaki	324/158.1
6,310,680 B1	10-2001	Taniguchi, Tetsuo	355/53
2002/0011863 A1	01-2002	Takahashi et al.	324/760
6,359,454 B1	03-2002	Khoury, Theodore A.	324/754
2003/0177633 A1	09-2003	Haji et al.	29/743
2005/0007135 A1	01-2005	Schneidewind et al.	324/757
2005/0151551 A1	07-2005	Okuda et al.	324/758
7,033,842 B2	04-2006	Haji et al.	438/6
2006/0119347 A1	06-2006	Shimada et al.	324/158.1
7,253,443 B2	08-2007	Yoshida et al.	257/80

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Isla-Rodas whose telephone number is (571) 272-5056. The examiner can normally be reached on Monday through Friday 8 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ha Nguyen can be reached on (571) 272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Richard Isla-Rodas
November 8, 2007

HA TRAN NGUYEN
SUPERVISORY PATENT EXAMINER